Memorandum

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To: William Tomko, Mayor, Village of Chagrin Falls
From: Aleksa Cyvas, PE, CT Consultants, Inc.
Subject: Village of Chagrin Falls – Cemetery Expansion Analysis
Date: 05/01/2024

This memo serves to outline how costs were calculated for the future phases of the Evergreen Cemetery expansion. This project has been undertaken to further expand the existing cemetery due to the diminishing amount of available graves sites remaining for purchase. This analysis has been completed for the life span of gravesite sales, which has been calculated to be 45 years.

The Evergreen Cemetery Expansion Project has been broken out into three phases – short, intermediate, and long terms. Short term indicates an expected date to begin selling graves within the next 3 years, intermediate within the next 3 – 10 years, and long term is 10 years and longer. Anticipated projects have been placed into one of the three phases along with estimated design, construction, and construction administration costs. Note that there are several scattered locations throughout the cemetery where gravesites will become available when existing trees perish; these sites require little preparation once this occurs and therefore have minimal design and construction costs. Additionally, there is a potential for an unknown number of graves to become available as the Village repurchases unused gravesites; these gravesites have not been incorporated into the spreadsheet.

A low, high, and most likely cost were calculated to account for the range of possible revenue the Village may see. The most likely cost was developed through discussion with the Cemetery sexton of the burials that are most common today. The range of costs to estimate the sale of graves per project has been performed in the following manner:

> <u>For grave purchases</u>, costs for the grave plot itself, grave marker foundation, and burial cost have been included. Grave plots are currently $1,500, but headstone foundations and burial costs are ranges due to size and burial time and type. The high cost assumes the purchase of the gravesite, an adult casket and two urn burials after 2 pm, and the largest grave marker foundation size, while the conservative low cost estimates the purchase of a gravesite, an urn burial before 2 pm, and the smallest grave marker foundation size. The most likely cost accounts for two sets of cremains and all burials before 2 pm. Each grave plot allows a maximum of three burials within each individual gravesite.

> <u>For columbarium costs</u>, the fees for the niche, the face plate engraving, and the opening and closing of the columbarium for burial as well as the price of the mausoleum itself, blue stone pad, and memorial benches were included in the calculation. Niches house a maximum of two urns, thus two burial costs were assumed. Price ranges for tier selection as well as resident and non-resident fees were considered in the high and low price range calculations. The high cost consists of a non-resident purchase of a top tier

niche, a two-name engraving on the face plate, and opening and closing of the niche after 2 pm for two burials. The low cost estimate includes a resident purchase of a bottom tier niche with only a one-name engraving and both burials before 2 pm. The most likely cost assumed two burials before 2 pm. Additionally, there are 4 memorial benches that surround each columbarium which provide space for two sets of cremains each.

Approximately 15 gravesites and 20 columbarium niches are sold annually, and about 50 burials occur per year. The current trends of full burials, in-ground cremations, and columbarium burials are changing; for the purposes of these calculations, 15 full burials, 25 in-ground cremations, and 10 columbarium burials were assumed for each year. Assuming the current projections, the complete cemetery expansion plan would supply gravesites for purchase for approximately 45 years, but burials would continue for several years beyond that. Burials will continue far longer than gravesite purchases because 2 to 3 burials are allowed per gravesite type and also because the gravesites are usually purchased well in advance of their total use. It was also assumed that prices would increase by 15% every five years, which is indicated on both amortization schedules. This equates to a cost increase of 3% annually. These assumptions were used to build the amortization schedules for gravesite and burial costs to estimate the revenue more realistically for the phases discussed within this expansion project. The total sums on the amortization schedules can be added together for the grand total of revenue generated by this expansion project through its entirety.

Further improvements to the cemetery may still be planned. Walking path connections, ADA and landscaping improvements, pavement repairs, and many other enhancements throughout the cemetery are current possibilities. These items do not affect gravesite additions and therefore have been left out of this analysis. Lastly, additional cemetery development will be considered as the existing graves are sold and as potential expansion areas are located.

In summary, in both the constant dollar scenario and the assumed price increase of a modest 15% every 5 years (3% per year) scenario, the low, most likely, and high costs situations yield a positive net revenue generation to the Village. In the conservative (and unrealistic) assumption that burial prices are not raised during the period of projection, the net revenue generation is $1,976,325 in the low, $3,811,975 in the most likely, and $6,548,225 in the high scenario. Although, the most realistic project return – assuming the prices are raised every 5 years by 15% - the net revenue generated to the Village is $10,381,315. Additionally, burials will continue beyond the 45-year analysis and provide consistent revenue beyond the final gravesite sale. This net revenue generation and continued burial costs will be used for ongoing maintenance and operations costs for the cemetery.

Cemetery Expansion

Opinion of Probable Costs

	Estimated Construction Cost	Burial Sites Created			Sale of Graves Cost[1]			Net Revenue Generated[2]		
		Short	Intermediate	Long	Low	Most Likely	High	Low	Most Likely	High
Existing Plots yet to be Sold	$ -	30			$ 84,750	$ 90,750	$ 157,500	$ 84,750	$ 90,750	$ 157,500
Section 51	$ 10,000	26			$ 73,450	$ 78,650	$ 136,500	$ 63,450	$ 68,650	$ 126,500
Section 52	$ 10,000	7			$ 19,775	$ 21,175	$ 36,750	$ 9,775	$ 11,175	$ 26,750
Section 52A	$ 10,000	28		37	$ 183,625	$ 196,625	$ 341,250	$ 173,625	$ 186,625	$ 331,250
Section 21	$ -		62		$ 150,350	$ 187,550	$ 325,500	$ 150,350	$ 187,550	$ 325,500
Mausoleum Improvements	$ 500,000		125		$ 875,000	$ 950,000	$ 1,034,375	$ 375,000	$ 450,000	$ 534,375
Old Abandoned Road	$ -			64	$ 251,200	$ 272,000	$ 390,400	$ 251,200	$ 272,000	$ 390,400
Removal of Cul-de-sac + Additional Columbariums	$ 300,000			296	$ 916,050	$ 1,365,300	$ 2,036,500	$ 616,050	$ 1,065,300	$ 1,736,500
Columbariums near Flagpole	$ 352,000		232		$ 800,000	$ 1,287,200	$ 1,404,800	$ 448,000	$ 935,200	$ 1,052,800
							Subtotal	**$ 2,172,200**	**$ 3,267,250**	**$ 4,681,575**
<u>Existing Culvert Area</u>										
Daylighting of Stream (OEPA)	$ (201,000)		-		$ -	$ -	$ -	$ 201,000	$ 201,000	$ 201,000
Daylighting of Stream (Village)	$ 100,000		250		$ 706,250	$ 756,250	$ 1,312,500	$ 606,250	$ 656,250	$ 1,212,500
Columbariums/Mausoleums	$ 150,000		98		$ 348,000	$ 849,600	$ 914,400	$ 198,000	$ 699,600	$ 764,400
One Lane Vehicular Bridge	$ 1,250,000	-	-	-	$ -	$ -	$ -	$ (1,250,000)	$ (1,250,000)	$ (1,250,000)
							Subtotal	**$ (244,750)**	**$ 306,850**	**$ 927,900**
<u>Reconfiguration of Current Maintenance Area</u>										
South Side Drainage	$ 150,000			115	$ 278,875	$ 347,875	$ 603,750	$ 128,875	$ 197,875	$ 453,750
Relocate Maintenance Building	$ 450,000			200	$ 485,000	$ 605,000	$ 1,050,000	$ 35,000	$ 155,000	$ 600,000
Pavement from S Franklin to Daylighting	$ 100,000	-	-	-	$ -	$ -	$ -	$ (100,000)	$ (100,000)	$ (100,000)
Rain Garden Drainage and Landscaping	$ 15,000	-	-	-	$ -	$ -	$ -	$ (15,000)	$ (15,000)	$ (15,000)
							Subtotal	$ 48,875	$ 237,875	**$ 938,750**
							TOTAL RETURN:	**$ 1,976,325**	**$ 3,811,975**	**$ 6,548,225**

[1] Prices are shown in current (2024) dollars.

[2] The dollar amounts shown indicate no price increases over the span of this project indicating that the project still provides a positive net revenue generation.
Net revenue generation will be used fund general upkeep and maintenance of the Cemetery.
See amortization schedules for more realistic revenue generation from a 15% price increase every 5 years for gravesite purchases and burial costs.

Cemetery Expansion

Opinion of Estimated Most Likely Costs

	Estimated Construction Cost	Burial Sites Created			Sale of Graves Cost[1]	Net Revenue Generated[2]
		Short	Intermediate	Long		
Existing Plots yet to be Sold	$ -	30			$ 90,750	$ 90,750
Section 51	$ 10,000	26			$ 78,650	$ 68,650
Section 52	$ 10,000	7			$ 21,175	$ 11,175
Section 52A	$ 10,000	28		37	$ 196,625	$ 186,625
Section 21	$ -		62		$ 187,550	$ 187,550
Mausoleum Improvements	$ 500,000		125		$ 950,000	$ 450,000
Old Abandoned Road	$ -			64	$ 272,000	$ 272,000
Removal of Cul-de-sac + Additional Columbariums	$ 300,000			296	$ 1,365,300	$ 1,065,300
Columbariums near Flagpole	$ 352,000		232		$ 1,287,200	$ 935,200
					Subtotal	**$ 3,267,250**
Existing Culvert Area						
Daylighting of Stream (OEPA)	$ (201,000)		-		$ -	$ 201,000
Daylighting of Stream (Village)	$ 100,000		250		$ 756,250	$ 656,250
Columbariums/Mausoleums	$ 150,000		98		$ 849,600	$ 699,600
One Lane Vehicular Bridge	$ 1,250,000	-	-	-	$ -	$ (1,250,000)
					Subtotal	**$ 306,850**
Reconfiguration of Current Maintenance Area						
South Side Drainage	$ 150,000			115	$ 347,875	$ 197,875
Relocate Maintenance Building	$ 450,000			200	$ 605,000	$ 155,000
Pavement from S Franklin to Daylighting	$ 100,000	-	-	-	$ -	$ (100,000)
Rain Garden Drainage and Landscaping	$ 15,000	-	-	-	$ -	$ (15,000)
					Subtotal	$ 237,875
					TOTAL RETURN:	**$ 3,811,975**

[1] Prices are shown in current (2024) dollars.

[2] The dollar amounts shown indicate no price increases over the span of this project indicating that the project still provides a positive net revenue generation.
Net revenue generation will be used fund general upkeep and maintenance of the Cemetery.
See amortization schedules for more realistic revenue generation from a 15% price increase every 5 years for gravesite purchases and burial costs.

Cemetery Expansion

Total Gravesites Created

	Estimated Construction Cost		Burial Sites Created		
			Short	Intermediate	Long
Existing Plots yet to be Sold	$	-	30		
Section 51	$	10,000	26		
Section 52	$	10,000	7		
Section 52A	$	10,000	28		37
Section 21	$	-		62	
Mausoleum Improvements	$	500,000		125	
Old Abandoned Road	$	-			64
Removal of Cul-de-sac + Additional Columbariums	$	300,000			296
Columbariums near Flagpole	$	352,000		232	
				Subtotal	**907**
Existing Culvert Area					
Daylighting of Stream (OEPA)	$	(201,000)		-	
Daylighting of Stream (Village)	$	100,000		250	
Columbariums/Mausoleums	$	150,000		98	
One Lane Vehicular Bridge	$	1,250,000	-	-	-
				Subtotal	**348**
Reconfiguration of Current Maintenance Area					
South Side Drainage	$	150,000			115
Relocate Maintenance Building	$	450,000			200
Pavement from S Franklin to Daylighting	$	100,000	-	-	-
Rain Garden Drainage and Landscaping	$	15,000	-	-	-
				Subtotal	**315**
				TOTAL GAVESITES:	**1,570**

GRAVESITE SALE AMORTIZATION SCHEDULE

Years		Price Increase Every 5 Years	Number of Gravesites Remaining	Number of Graves Sold	Price of Gravesite	Gravesite Revenue	Number of Niches Sold	Average Price of Niche	Niche Revenue
2024	2029	15%	1570	100	$ 1,500.00	$ 150,000.00	75	$ 4,000.00	$ 300,000.00
2029	2034	15%	1395	100	$ 1,725.00	$ 172,500.00	75	$ 4,600.00	$ 345,000.00
2034	2039	15%	1220	100	$ 1,983.75	$ 198,375.00	75	$ 5,290.00	$ 396,750.00
2039	2044	15%	1045	100	$ 2,281.31	$ 228,131.25	75	$ 6,083.50	$ 456,262.50
2044	2049	15%	870	100	$ 2,623.51	$ 262,350.94	75	$ 6,996.03	$ 524,701.88
2049	2054	15%	695	100	$ 3,017.04	$ 301,703.58	75	$ 8,045.43	$ 603,407.16
2054	2059	15%	520	100	$ 3,469.59	$ 346,959.11	75	$ 9,252.24	$ 693,918.23
2059	2064	15%	345	100	$ 3,990.03	$ 399,002.98	75	$ 10,640.08	$ 798,005.96
2064	2069	15%	170	100	$ 4,588.53	$ 458,853.43	70	$ 12,236.09	$ 856,526.40
					TOTAL:	**$ 2,517,876.29**		**TOTAL:**	**$ 4,974,572.13**

BURIAL AMORTIZATION SCHEDULE												
Years		Price Increase Every 5 Years	Full Burials Per 5 Years	Price of Full Burial	Full Burial	In-Ground Cremations Per 5 Years	Price of In-Ground Cremation	In-Ground Cremation Revenue	Niche Burials Per 5 Years	Average Price of Niche	Niche Revenue
2024	2029	15%	75	$ 1,000.00	$ 75,000.00	125	$ 700.00	$ 87,500.00	50	$ 4,000.00	$ 200,000.00
2029	2034	15%	75	$ 1,150.00	$ 86,250.00	125	$ 805.00	$ 100,625.00	50	$ 4,600.00	$ 230,000.00
2034	2039	15%	75	$ 1,322.50	$ 99,187.50	125	$ 925.75	$ 115,718.75	50	$ 5,290.00	$ 264,500.00
2039	2044	15%	75	$ 1,520.88	$ 114,065.63	125	$ 1,064.61	$ 133,076.56	50	$ 6,083.50	$ 304,175.00
2044	2049	15%	75	$ 1,749.01	$ 131,175.47	125	$ 1,224.30	$ 153,038.05	50	$ 6,996.03	$ 349,801.25
2049	2054	15%	75	$ 2,011.36	$ 150,851.79	125	$ 1,407.95	$ 175,993.75	50	$ 8,045.43	$ 402,271.44
2054	2059	15%	75	$ 2,313.06	$ 173,479.56	125	$ 1,619.14	$ 202,392.82	50	$ 9,252.24	$ 462,612.15
2059	2064	15%	75	$ 2,660.02	$ 199,501.49	125	$ 1,862.01	$ 232,751.74	50	$ 10,640.08	$ 532,003.98
2064	2069	15%	75	$ 3,059.02	$ 229,426.71	125	$ 2,141.32	$ 267,664.50	50	$ 12,236.09	$ 611,804.57
				TOTAL:	**$ 1,258,938.15**		**TOTAL:**	**$ 1,468,761.17**		**TOTAL:**	**$ 3,357,168.39**